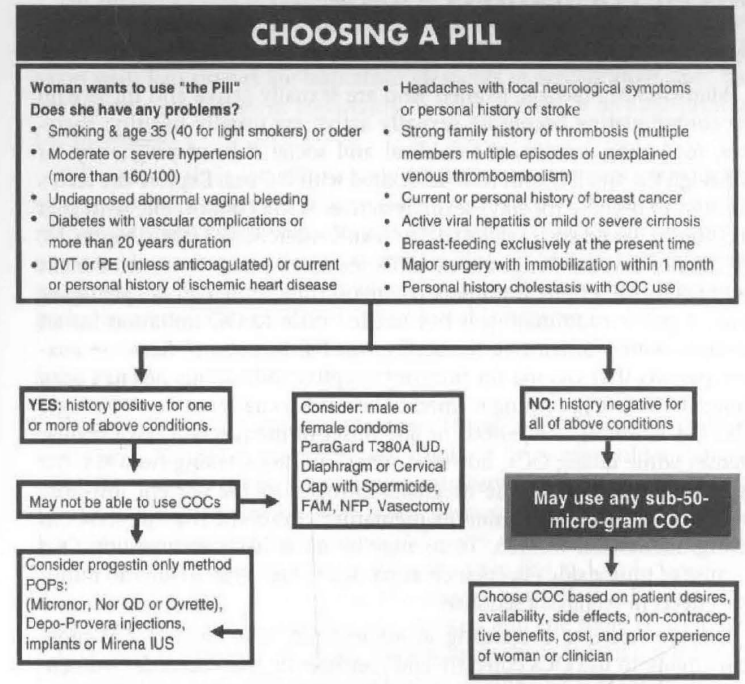
and/or swelling) occur during the week women take their placebo pills.[143] Because recent surveys have shown that many women would prefer to bleed less frequently than once a month,[144] it is time to re-evaluate the need for monthly withdrawal bleeding.[145] The purpose of menstruation in spontaneously cycling women is to resolve the prior unsuccessful cycle (no pregnancy) and to prepare for the next cycle (which may result in pregnancy). With OC use, however, conception is not desired; there is no biological need to provoke artificial withdrawal bleeding on a monthly basis. Unless the patient wants to use bleeding as a reassurance that she is not pregnant, monthly cycling is *not* necessary and may be replaced by extended OC use.[146] In clinical studies, women with prolonged flow had fewer menstrually related problems, and the majority of those women continued to use the extended cycle.[147] The regimen using extra packs of pills is cost-effective for women with menorrhagia.[148] Other women for whom extended use would be particularly attractive are those with dysmenorrhea or menstrual migraines, and those on active military duty or who have similarly demanding jobs.

Options for extended use include the following:

- *Brief manipulation of a cycle for convenience* such as for a honeymoon, trip, athletic event, camping experience, business meetings, exams or presentations.
- *Bicycling*, which is the back-to-back of 2 packs of active pills by taking the first pack of 21 active pills, throwing away the 7 placebo pills in that first pack and immediately starting the second pack of 21 active pills followed by the 7 placebo pills at the end of the second package. Recent studies of extended cycles ("bicycling") found that the longer cycles had significant reduction in the days of bleeding and in annual expenditures for female hygiene.
- *Tricycling*, meaning taking the 21 active pills from 3 packages followed by the 7 placebo pills from the third package.
- *Taking Seasonale*, which contains 84 active pills followed by 7 placebo pills. A woman using this regimen has four periods a year, hence the name, Seasonale.
- *No-cycling*, meaning taking active pills indefinitely (for many months or years) with no placebo pills as long as the woman has no troublesome spotting. Seasonale or any strong progestin monophasic pills may be used in this off-label manner.

CHOOSING A FORMULATION

Clinicians in the United States have numerous OCs from which to choose. (See the color insert for photographs and formulations of pills available in the United States). Select an OC based on the hormonal dose and on the woman's clinical picture. Figure 19-2 gives an algorithm to help clinicians.



- The World Health Organization and the Food and Drug Administration both recommend using the **lowest dose pill** that is effective. All combined pills with less than 50 pg of estrogen are effective and safe.
- There are no studies demonstrating a decreased risk of deep vein thrombosis (DVT) in women on 20 mcg pills. Data on higher dose pills (50 mcg EE vs. 30 mcg) have demonstrated that the less the etrogen dose, the lower the risk for DVT.
- All COCs lower free testosterone. In the US, only Ortho Tri-Cyclen and Estrostep have FDA labeling indicating it as a treatment of moderate acne vulgaris, based on results of randomized, placebo controlled trials. Other formulations are under study. Class labeling in Canada for all combined pills states that use of pills may improve acne. In Canada, only Tri-Cyclen has "treatment of moderate acne vulgaris" as an indication for use.
- To minimize discontinuation due to spotting and breakthrough bleeding, warn women in advance, reassure that spotting and breakthrough bleeding become better over time.
- To attain the most favorable lipid profile, consider norgestimate, desogestrel pill or low dose norethindrone acetate, or norethindrone (Ovcon-35) or ethnodiol diacetate (Demulen 1/35 or Zovia 35). No clinical benefits have been demonstrated to be attributable to difference in lipids caused by these pills. Estrogen has a beneficial effect on the walls of blood vessels. All currently available COCs raise triglycerides.

Source: Modified from Hatcher RA, et al. (2003),[149] with permission.

Figure 19-2 Choosing a pill

SPECIAL POPULATIONS

ADOLESCENT WOMEN

Menstruating teenage women who are sexually active and those who are contemplating becoming sexually active are usually healthy; therefore, for young women, the medical and social risks of pregnancy far outweigh the small health risks associated with OC use. Explore the teen's decision to become (or stay) sexually active. Is she comfortable with that decision or would she prefer to delay sexual intercourse? (See Chapter 13, Abstinence and the Range of Sexual Experience.) Many teens can benefit from taking OCs to treat primary dysmenorrhea, anovulatory cycling, or acne. A pelvic examination is not needed prior to OC initiation for an asymptomatic woman (see the section on Pill Initiation). Reassure anxious parents that OC use for noncontraceptive indications has not been shown to encourage young women to become sexually active. A teenager who has had irregular periods or late onset of menses will have regular menses while taking OCs; however, when she stops taking her OCs, her periods may again become irregular. Estrogen in the current low-dose OCs do not limit height due to premature closure of the epiphyses in young, menarchal women. Teens may be more likely to abandon OCs because of minor side effects such as nausea or spotting, so take all minor side effects in teenagers seriously.

Provide concrete counseling to adolescents, who may find it more challenging to use OCs correctly and consistently than do older women. Instruct each teen who wants to use OCs about condom use, both for reducing the risk of acquiring STIs and for back-up in case she discontinues taking the pill. Provide emergency contraception and instructions on how to use it if she needs it. Studies have shown that women of all ages are more able to successfully use the once-a-week or once-a-month methods than they are able to remember to take a pill once a day. However, in the patch study, 18- and 19-year-olds showed the greatest improvement in successful utilization rates. For this reason, offer the vaginal ring and patch to teens considering OCs.

PERIMENOPAUSAL WOMEN

Healthy, nonsmoking women in their 40s are candidates for combined hormonal contraception. OCs can help regulate menstrual bleeding and reduce the risks of irregular bleeding and endometrial hyperplasia associated with anovulatory cycling during the perimenopausal years. Women in their 40s are at highest risk for menorrhagia due to leiomyoma and adenomyosis; OCs can provide medical alternatives to hysterectomy. OCs also help reduce the risk of ovarian and endometrial cancers. Another significant advantage OCs offer many women who are experiencing hormonal fluctuations is reduction of vasomotor symptoms, especially if OCs are used on an extended cycle basis. (See the Menopause Chapter.)

No special testing is required prior to prescribing OCs for women in their 40s, except for blood pressure measurement. Screening measures such as clinical breast exams, mammograms, serum lipids, and pelvic exam with Pap smears are important elements of well-woman care, but need not be performed in apparently healthy women of any age prior to OC initiation.

OC users in their late 40s or early 50s may not experience traditional symptoms of menopause while taking OCs. They will not experience menstrual irregularities or hot flashes, especially if the OCs are used on an extended basis. In this context, it may be difficult to detect when menopause occurs. Do not rely on blood tests to diagnose menopause in perimenopausal women. (See Chapter 5 on Menopause.)

SMOKERS

Heavy smoking by women older than 35 precludes the use of estrogen-containing hormonal methods. *Any* smoking by women older than 40 precludes use of estrogen-contining contraceptive on an ongoing basis. Light smoking by women age 35 to 40 merits caution (WHO category 3). For example, smoking increases an OC user's risk of heart attack nearly 13- to 14-fold.[150] Indeed, women who smoke as few as 1 to 4 cigarettes a day have a 2.5 fold increased risk of coronary heart disease.[151] The older the smoker, the more cigarettes she smokes, and the more concomitant cardiovascular problems she faces, the less likely she is to be a candidate for OCs, especially if she can use more effective methods such as progestin-only injections or IUDs. In otherwise healthy young women, the absolute risk of cardiovascular disease is low, so that estrogen-containing contraceptives in women who smoke are still safer than the risks of pregnancy. The first priority in caring for a woman who smokes is to encourage and aid her to stop smoking, or to significantly reduce the number of cigarettes she smokes each day. Three to 12 months after stopping smoking, past smokers have the same OC-related cardiovascular risks as nonsmokers.

In selecting a pill for smokers, the clinician is conflicted. On the one hand, the ideal pill would have the lowest estrogen content (to reduce arterial thrombosis) and the lowest androgenicity (to minimize any adverse impacts on lipids). Smokers tend to metabolize estrogen more rapidly and to increase SHBG levels more than nonsmokers do, so that the 20-mcg EE dose pill may not provide as much contraceptive efficacy for a smoker. However, there are no clinical trials to provide guidance. It may be prudent to start smokers and nicotine patch/gum/etc. users on 20 mcg EE formulation with a strong (low androgenic) progestin, advise them to use a back-up method during the first 2 to 3 months, and monitor breakthrough bleeding as a marker of adequate serum levels. If she has persistent breakthrough bleeding on a 20-mcg EE pill, use of a 25 to 30 mcg EE formulation or delivery system may be advisable. Shortening the pill-free interval may be helpful.

POSTPARTUM WOMEN

Pregnancy is a hypercoagulable state. Estrogen increases the risk of venous thrombosis and embolism (VTE). As a result, it is generally recommended that postpartum women delay use of estrogen-containing contraception until 3 to 4 weeks postpartum, when those pregnancy-induced changes in the coagulation system have waned.

BREASTFEEDING WOMEN

Although many progestin-only methods may be used immediately postpartum, estrogen may decrease the quantity and quality of breast milk (see Chapter 23 on Postpartum Contraception and Lactation). Therefore, the American Academy of Pediatrics advises against use of estrogen as long as the woman is exclusively breast-feeding. Estrogen can be used as soon as supplemental sources of nutrition are introduced into the infant's diet (if the mother is at least 3 to 4 weeks postpartum).

WOMEN WITH MEDICAL PROBLEMS

Diabetes. As the WHO guidelines state, only women with uncomplicated diabetes can be considered for OC use. Women with advanced diabetes complicated by nephropathy (proteinuria), retinopathy, neuropathy, or diabetes of more than 20-years duration are not candidates for estrogen-containing methods (WHO:4). If uncomplicated diabetes is combined with hypertension, smoking, or other major risk factors for cardiovascular disease, estrogen-containing contraceptives may not be used.

For diabetic women who are candidates for OCs, consider each of the components of the pill. Progesterone is a competitive inhibitor of insulin at the insulin receptor; therefore, a pill with low progesterone activity is important. Estrogen can decrease insulin release by the islet cells of the pancreas, so a relatively low-dose estrogen formulation may be favored. Androgens can have an adverse impact on lipids and increase the woman's risk for cardiovascular disease. However, any low-dose pill with similar properties is quite reasonable.

Sickle cell anemia. Women with sickle cell disease are predisposed to occlusion of the microvasculature. However, OC users and non-users appear to have no differences with regard to coagulation studies, blood viscosity measurements, or incidence or severity of painful sickle cell crises. In addition, women with sickle cell anemia can ill afford to lose menstrual blood. Sickle cell disease (WHO:1) and thallassemia (WHO:2) are not reasons to avoid OCs.[130]

Gallbladder disease. WHO recommends that women with symptoms of gallbladder disease and those who are being treated medically for gallbladder disease not use estrogen-containing contraception if more appropriate methods are acceptable (WHO:3). Similarly, women who have experienced cholestatic jaundice in pregnancy may use OCs with caution (WHO:2), although those who experienced jaundice with past OC use fall into category 3.

Cervical dysplasia. Women who have cervical dysplasia or who have a history of previously treated cervical dysplasia may still use combined hormonal contraception (WHO:2).

Special issues for drospirenone-containing OCs. Do not prescribe Yasmin or such formulations to patients with conditions that predispose to hyperkalemia (i.e., renal insufficiency, hepatic dysfunction, and adrenal insufficiency).

MANAGING SIDE EFFECTS

A double-blind trial showed no difference in the incidence of any of the traditionally "hormonally-related" side effects during the 6-month comparison of OC users and placebo pills users. Similar percentages of women in each group developed headaches, nausea, vomiting, mastalgia, weight gain, etc.[152] This finding differs from the impression given by the pill package labeling, because the side effect numbers in labeling come from clinical trials and reflect the events that women had *while* they use pills that could possibly be related to pill use, not events that occur *because* of the pill. Similarly, when women with "pill side effects" such as nausea, headache, irritability, fatigue, weight gain, breast tenderness, and breakthrough bleeding were treated in another study with either Vitamin B_6 or sugar pill, both groups improved in all symptoms.[153]

However, 59% to 81% of women who discontinued OC use in one study reported that they stopped due to side effects. Therefore, management of side effects on OCs is crucial to successful use of hormonal contraceptives. Counsel all potential hormonal contraceptive users that side effects are possible (Table 19-5), but not necessarily to be expected. Advise women that side effects are usually transient and often respond to changes in pill formulation.

Absence of withdrawal bleeding

Advise women that the amount of withdrawal bleeding may be significantly lower with hormonal methods. Even scant bleeding or spotting on the placebo pills counts as withdrawal bleeding. The incidence of complete lack of withdrawal bleeding varies with different formulations and increases with duration of use. Some women deliberately extend the numbers of active pills they use (bicycling, tricycling, or extended use) to achieve amenorrhea. For women using cyclic regimens of hormonal contraceptives who fail to have withdrawal bleeding, obvious causes of amenorrhea (such as pregnancy) must be excluded. Other specific conditions, such as cervical stenosis, need to be evaluated, particularly if the patient has recently had cervical surgery (e.g., D&C, cone biopsy, LEEP,etc). When women use hormonal contraceptives, it is far less likely that other common causes of amenorrhea are present. For example, thyroid problems, prolactinoma, and hypothalamic amenorrhea due to stress or excessive exercise or anovulatory states such as PCOS or obesity are important considerations when a woman not using hormonal contraceptives develops amenorrhea. However, combined

hormonal contraceptives restore predictable menstrual cycling in women with these problems.

Women who enjoy the lack of withdrawal bleeding but just want to reassure themselves periodically that they are not pregnant may use home pregnancy tests or may want to monitor their basal body temperature (BBT) during 3 sequential days of placebo pills. If that BBT is <98°F, the likelihood of pregnancy is very low. If women desire to have cyclic withdrawal bleeding, switching to a more estrogenic formulation or to a triphasic formulation may decrease the likelihood of amenorrhea.

Table 19-5 Estrogenic, progestogenic, and combined effects of oral contraceptive pills

Estrogenic effects	Estrogen + progestin effects	Progestin effects
• Nausea • Increased breast size (ductal and fatty tissue) • Leukorrhea • Cervical eversion or ectopy • Hypertension • Rise in cholesterol concentration in gallbladder bile • Telangiectasia • Hepatocellular adenomas • Cerebrovascular accidents (rare) • Thromboembolic complications including DVT or pulmonary emboli (rare) • Decreased libido and/or enjoyment of intercourse • Pruritus (Most pills with less than 50 mcg of ethinyl estradiol are less likely to produce troublesome estrogen-mediated side effects or complications.	Both the estrogenic and the progestational components of oral contraceptives may contribute to the development of the following adverse effects: • Breast tenderness • Headaches • Hypertension • Myocardial infarction (rare) • Cyclic weight gain due to fluid retention • Growth of leiomyomata • Stimulation of breast neoplasia (exceedingly rare)	All low-dose combined pills suppress a woman's production of testosterone, which has a beneficial effect on acne, oily skin and hirsutism. The progestin component may have androgenic as well as progestational effects: • Increased appetite and weight gain • Depression, fatigue, tiredness • Acne, oily skin • Increased LDL cholesterol levels • Decreased HDL cholesterol levels • Decreased carbohydrate tolerance; increased insulin resistance • Bloating • Constipation

Acne, oily skin, hirsutism

Two formulations have FDA approval for the treatment of acne (Ortho TriCyclen and Estrostep). Progestin inhibits LH release, which decreases ovarian androgen production. Estrogen increases hepatic production of sex hormone-binding globulin, which binds testosterone and other androgens in the woman's circulation. Occasionally (<10%) women will report worsening or new onset of acne, oily skin, or hair growth. Consider other causes of androgen exposure (other medications, ovarian tumors, etc.). If it appears her OC may be contributing to her problem, switch to a less androgenic formulation (e.g., Yasmin, Ortho Tri-Cyclen, Desogen, Ovcon-35).

Gastrointestinal complaints

Working at the level of the central nervous system, estrogen can cause nausea or vomiting. Sex steroid hormones do not directly affect the gastric lining, although new research has demonstrated a hormonal impact on the intrinsic firing rate of the gastric pacemaker cells. Progesterone slows peristalsis and can induce constipation and sensations of bloating and distention. Most affected women acclimate to the hormones, and nausea resolves within 1 to 3 months of use. If a woman complains of nausea, she can try taking her pills with food or at night. Avoid double dosing. Counsel the patient to "catch up" any pills she forgets by taking pills at 12-hour intervals, rather than 2 pills at one time, which increases the likelihood of nausea. In addition, advise more fluids and fresh fruits and vegetables. Women with recent onset of severe gastrointestinal symptoms should be evaluated promptly to rule out problems, such as cholecystitis, appendicitis and diverticulitis.

If vomiting or diarrhea is related to taking the pill, try the following approaches:

- Decrease hormone dose. A 20 mcg OC dramatically decreases nausea for many women, although it may also lead to more spotting and breakthrough bleeding.
- Bloating and constipation may be helped with a reduction in the progestin component in the pill. Bloating associated with menses can be diminished by extended cycle or continuous active pill use.
- Try progestin-only formulations to control nausea and other symptoms.
- Consult the Instructions for Using Oral Contraceptives for guidance on how to manage missed pills due to vomiting or poor absorption due to diarrhea.

Headaches

Headaches occur commonly. Controlled trials found that women using placebo pills experienced as many headaches as did OC users.[152] Nonetheless, headaches in an OC user deserve evaluation, because they are the major warning sign that precedes stroke. (See Figure 19-3.) If a woman begins having headaches or her headaches worsen after she starts OCs, consider all differential diagnoses. Measure the patient's blood pressure to rule out hypertension.

- Determine the type of headache. Ask about the severity of the headache, aura, duration, character (throbbing or constant),

cyclicity, and location (including asymmetry). Ask about associated symptoms, such as photophobia, nausea, vomiting, dizziness, scotomata, blurred vision, watering of the eyes, loss of vision or speech, weakness or numbness. Can the patient function when the headaches are most severe? What medication provides relief?

- Rule out other causes, such as transient ischemic attacks, migraine headaches, vascular headaches, or cerebrovascular accident; hypertension; cyclic fluid retention induced by OCs; sinusitis, viremia, sepsis, or allergy; temporomandibular joint (TMJ) disorders or dental problems; drug use, alcohol or caffeine withdrawal, or central nervous system tumor.

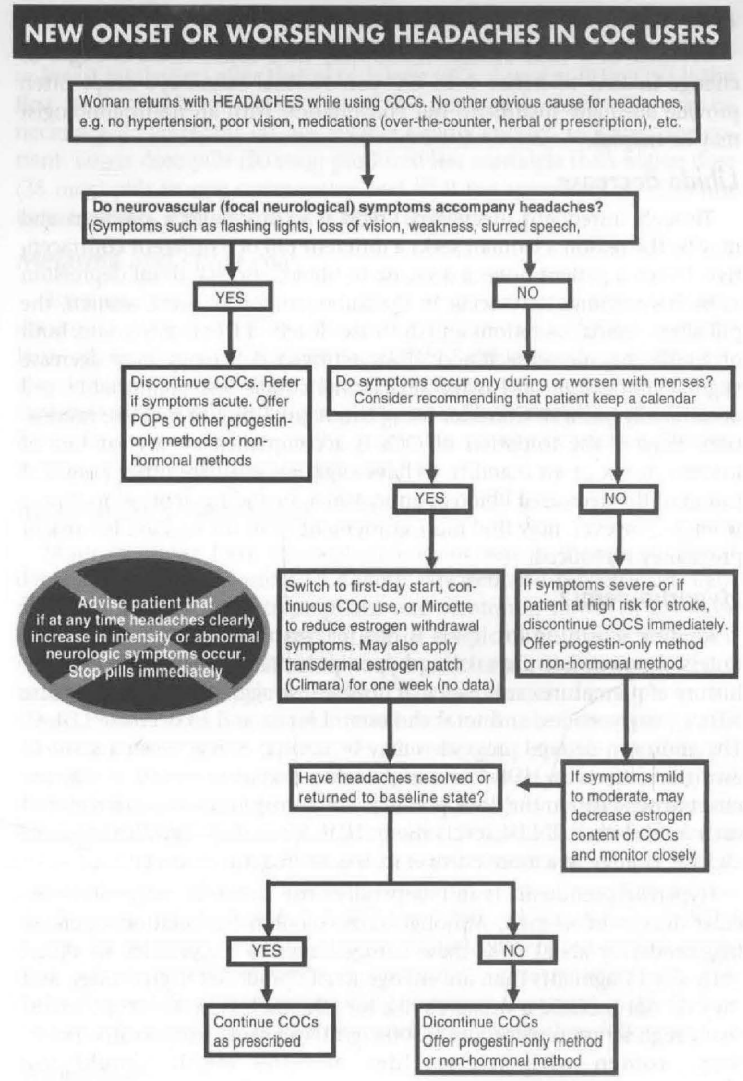
Tension headache. The most common headache is the tension headache, which usually starts as a neck pain late in the day and radiates through the occipital area over the scalp to involve the forehead. There are no associated neurologic sensations, but women with tension headaches may experience nausea or vomiting from the intensity of the pain. These headaches usually respond to over-the-counter analgesics and/or rest. Rarely is it necessary to change pill formulations.

Migraine headache. The headache that causes most medical concern is the migraine headache, which tends to occur in the temporal region and is more frequently unilateral. Although the word "migraine" has become almost synonymous with severe headaches, it is important to identify the true migraines. If a woman develops new-onset migraine or a worsening in the severity or frequency of her headache, promptly reassess if she is still a candidate for using estrogen-containing contraceptives. If she has any associated neurological auras (flashing lights, tingling sensation, paraesthesias, etc), stop the OCs and provide contraception without estrogen. On the other hand, if her symptoms develop or worsen on the days she takes placebo pills (when the estrogen levels drop), it maybe possible to offer her extended-use, low-dose OCs to reduce her menstrual migraines.

Stroke. Strokes are often preceded for weeks or months by either visual symptoms or headaches or both. If a patient has experienced transient, total, or partial loss of vision; elevated blood pressure; or other neurologic symptoms, discontinue estrogen-containing hormonal contraceptives immediately and refer her to a neurologist. If visual impairment accompanies migraine headaches that have become worse, discontinue OCs immediately.

If the headaches are not serious and are related to OC use, consider the following approaches:

- Discontinue the OCs.
- Lower the dose of estrogen.
- Lower the dose of progestin.
- Tricycle. Eliminate the pill-free interval for 2 to 3 consecutive cycles of pills. This recommendation is helpful only if a woman's headaches occur during the pill-free interval.



Source: Hatcher RA, et al. (2003),[149] with permission.

Figure 19-3 New onset or worsening headaches in OC users

Lens effects

Women who wear contact lenses may note some visual changes or change in lens tolerance with OC use. Normal saline eye drops often provide adequate treatment, but consultation with an ophthalmologist may be helpful.

Libido decrease

Though infrequent, decreased libido is occasionally a problem and may be the reason a woman seeks a different pill or a different contraceptive. When a patient notes a decrease in libido, also ask about depression as both symptoms may occur in the same patient. In some women, the pill alters vaginal secretions and decreases levels of free testosterone, both of which may decrease libido.[154] An estrogen deficiency may decrease vaginal lubrication and make sexual intercourse less comfortable and occasionally painful. Consider using the vaginal ring to increase lubrication. Even if the initiation of OCs is accompanied by a clear loss of interest in sex or an inability to have orgasms, evaluate other potential causes of the decreased libido or anorgasmia, including depression. Many women, however, may find more enjoyment from sex because the risk of pregnancy is reduced.

Hyperlipidemia

Routine screening for lipids is not necessary before prescribing OCs unless a patient has pre-existing hyperlipidemia or a very strong family history of premature cardiovascular disease. Estrogen is known to increase HDL-C, triglycerides, and total cholesterol levels and to decrease LDL-C. The androgen-derived progestins may be neutral or may reverse some of estrogen's effects on HDL-C and triglycerides and increase LDL-C. The net effect depends upon the dose, potency, and estrogen/androgen balance of each formulation. If LDL levels rise or HDL levels drop significantly with OC use, change to a more estrogenic, less androgenic formulation.

Hypertriglyceridemia is an independent risk factor for early cardiovascular disease in women. Although most modern formulations increase triglycerides by about 30%, these estrogen-induced triglycerides are differently sized fragments than are endogenously produced triglycerides, and they do not increase a woman's risk for atherosclerosis. However, excessively high serum triglycerides (>500 mg/dl) can cause pancreatitis. Therefore, women with triglycerides of >350 mg/dl should use estrogen-containing hormonal contraceptives only with caution. Lower dose pills (20–25 mcg EE) would clearly be preferred to higher dose ones; progestin-only formulations may be necessary.

Mastalgia

Both estrogen and progestin affect the breast. The average woman experiences up to a 20% increase in breast volume in the luteal phase due to venous and lymphatic engorgement. Estrogen causes hypertrophy of the adipose cells in the breast and can cause increase in breast size. In addition, both hormones stimulate the terminal ductal lobular tuft growth especially in nulliparous women. Nearly 30% of women experience mastalgia or breast tenderness after they start taking OCs. A proper fitting bra is the first recommendation. Reduction of the doses of both steroids may be necessary if symptoms do not resolve rapidly enough to satisfy the patient. Lower dose pills (20 mcg) produced less mastalgia than higher dose (35 mcg) pills in one comparative trial.[155] If the symptoms develop just before menses, extended cycle length can help.

Melasma and chloasma

Estrogen stimulates the production of melanocytes and can cause darkening of pigmented areas (linea nigra). Darkening of patches on the face, often called the "mask of pregnancy," chloasma, or melasma can also develop. Women with darker skin pigment are more susceptible. The melasma fades slowly and incompletely after discontinuation of estrogen. Progestin-only methods may be preferable for at-risk women. Recommend consistent use of sunscreen and hats.

Mood swings, depression

Multiple studies have demonstrated no increase in the risk of clinical depression in women using OCs. Both estrogen and progestin in high-dose pills interact with tryptophans and serotonin; however, low-dose pills have not been implicated in any of these complaints.[55,155] Women on OCs remain solidly within normal ranges for all vitamins and do not require vitamin B supplementation.[156] Some women do report an increase in depressive symptoms, moodiness, and other emotional states when on OCs. This may represent an idiosyncratic response to hormones, which may warrant a decrease in hormone doses or pill cessation. However, it is important to identify when in a woman's cycle these symptoms develop. If the symptoms appear just before the menses, then extended or continuous use of active pills may dampen the hormonal swings.[147] If the patient desires withdrawal bleeding, restart her active pills each month on the first day of her menses. If there is any concern about an underlying depressive or anxiety disorder, these conditions deserve an explicit evaluation and treatment; cessation of hormonal contraceptives is not adequate therapy. Suicidal women need emergency treatment by specialists. Less acutely ill women may be managed locally with close follow-up.

Pregnancy

There is no evidence that OC users have higher rates of spontaneous abortion, preterm delivery, birth defects,[157–161] or compromise of fertility of offspring.[162] The risk of significant congenital anomalies is no higher than in the general population; no extra testing during prenatal care is needed because of early pregnancy exposure to steroidal hormones. Women should consider all their pregnancy options (keeping the baby, adoption, foster care, and abortion) based on their own personal situations; combined hormonal use should not influence that decision process.

Women who want to become pregnant should seek preconceptional care. They should start folic acid supplementation at least 1 to 3 months before they stop taking their pills. A routine dose of 0.4 mg folic acid supplement as found in prenatal vitamins is usually adequate. However, adolescent women who have had poor diets and prolonged OC use may benefit from 1 mg doses of folic acid preconceptionally and in the first trimester of pregnancy.

Once a woman discontinues the OCs, patches, or rings, her fertility returns rather rapidly to baseline rates. On average, there is a 2-week delay in the resumption of ovulation, but the normal time to ovulation ranges from 0 to 26 weeks. Barrier methods used to be suggested until a woman had her first spontaneous withdrawal bleed after stopping the pills. This was recommended to permit dating the pregnancy from the last menses. However, if a woman conceives the first month after stopping the pills, a dating ultrasound can be used to confirm the accuracy of her expected due date.

Vaginal discharge

Some women notice an increase in vaginal secretions with estrogen-containing contraceptives. These secretions generally are not an indication of infection. Women who use low OCs are not at any increased risk for developing uncomplicated candidal infections or bacterial vaginosis (BV). Reassurance is generally the only intervention needed once infection has been ruled out. Point out to the woman that these secretions are healthy and serve as lubricant during coitus.

Vaginal spotting and bleeding

Breakthrough spotting and bleeding are common (30% to 50%) in the first few months of OC use and generally resolve by the third to fourth month of use. Progestins administered early in the cycle reduce estrogen's proliferative influence and induce atrophy (thinning) of the uterine lining. When women first start to use OCs, their endometria must adjust to the exogenous hormones, so irregular spotting and bleeding is understandable. However, by the third pack of pills, 70% to 90% of women (depending upon the formulation) have no further breakthrough bleeding or spotting.

Before changing OC type, rule out more likely and more serious causes: pregnancy, infection (such as vaginitis and cervicitis), medications that block hormone aborption (olestin) or increase their metabolism by the liver (anticonvulsants, cigarette smoking, St. John's Wort, rifampin, griseofulvin), and gastrointestinal problems such as vomiting and diarrhea that may prevent adequate hormone absorption to sustain the uterine lining. *One of the most common causes of pill-associated spotting and bleeding is missed pills.*

For women with persistent irregular bleeding after 2 to 3 months of use, consider changing to other formulations, although no research indicates that any specific OC is best at eliminating spotting or bleeding.

- Women who report spotting or bleeding before they complete their active pills probably need more endometrial support. Increase the progestin content of their pills, either by changing to a different monophasic formulation or by switching to a triphasic formulation that increases progestin levels in the last active pills.
- Women with continued spotting after the withdrawal bleed need more estrogen support. Increase the estrogen in each tablet or decrease the progestin in the early pills (especially with a triphasic formulation). The cause of mid-cycle spotting/bleeding is not clear. One approach to this relatively uncommon bleeding pattern is to increase both estrogen/progestin mid-cycle with agents such as Triphasil and Tri-Levlen.

Seasonale. Some women experience spotting and breakthrough bleeding while using an extended-use pill such as Seasonale. Here are two suggestions to reduce these problems:

- Inform users that, as with all other pills, they will have more spotting initially when they begin taking pills. This spotting will decrease rapidly over time.
- One approach for Seasonale users is to take one pill every day for the first 21 days whether or not spotting occurs. Thereafter, on the first day of significant spotting, they can stop taking pills for 2-3 days to allow a withdrawal bleed to start, and then they should restart the active pills, taking at least 1 full pack each time before they stop again. As they take pills in this pattern, the length of time between spotting will increase and they will be able to eventually take pills for the full 84 days.

Weight change

A placebo-controlled, randomized clinical trial has demonstrated that there is no difference in weight gain due to low-dose OC use.[163] Similarly, a prospective trial of women using triphasic OCs with daily weight measurements for 4 months showed no change in mean weight at the end of the trial compared to baseline, although some weight fluctuations were noted during the cycle.[164] Oral contraceptive use by adolescent women has been shown not to be associated with either weight gain or increased body fat in a 9-year study.[165] In clinical trials, women who use OCs do not typically gain any more weight than women living in the United States typically gain in the same time interval.

However, some women may respond robustly to any of the pill's hormones. Increased measurements in the breasts, hips, and thighs reflect estrogen's impact on adipose cells (hypertrophy). Decreasing estrogen in the pill can reduce this impact. Weight gain similar to premenstrual fluid retention is due to increased aldosterone release and results from estrogen activity augmented by progesterone. In this situation, switch to a pill with both lower estrogen and progestin levels. Drospirenone-containing OCs, which have an antimineralocorticoid activity (mild diuretic effect), may

also be an appropriate choice in this condition. Steadily increasing weight may be attributed to the nitrogen retention and increase in muscle mass stimulated by androgens. Although it is unlikely that the pill would be responsible for this type of weight gain, switching to a low androgenic pill (Ortho Tri-Cyclen, Ovcon-35, Modicon, Yasmin, etc.) may address that patient's concerns. Every woman should be encouraged to adopt a healthy diet and to exercise routinely to achieve and maintain a healthy weight.

PILLS AND DRUG INTERACTIONS

Some drugs may negatively influence the effectiveness of combined hormonal contraceptives:

Anti-tuberculosis. Rifampicin (Rifampin) and rifabutin increase hepatic clearance of EE and progestins.[166] Although rifampicin did not permit break-through ovulation in one small study,[167] product labeling and several published reports recommend women using these agents avoid taking OCs.

Antifungal (systemic). Griseofulvin increases microsomal enzyme activity and theoretically may decrease OC efficacy.

Anticonvulsants. Many of the anticonvulsants, such as barbituates, carbamazepine (Tegretol), oxcarbazepine, (Trileptal), phenobarbital, phenytoin (Dilantin), primidone (Mysoline), topiramate (Topamax) and felbamate (Felbatol) induce various cytochrome p450 activities and reduce circulating levels of contraceptive hormones. In some women, low doses can induce profound changes in circulating estrogen levels; in others, high doses of anticonvulsants produce minimal effect. Do not offer low-dose (<35 mg EE) formulations to a woman using these anticonvulsants unless she uses a back-up contraceptive method. If she has no breakthrough bleeding while using a 35-mcg EE pill with a back-up barrier method for 3 months, she may rely on the pills exclusively. However, many women using these anticonvulsants do require 50 mcg EE (not mestranol) pills to control breakthrough bleeding and possibly prevent escape ovulation. These drugs also affect the circulating levels of estrogen and progestin from the patches and vaginal rings. No data are available yet about efficacy of these methods in women using anticonvulsants. Therefore, exercise caution and recommend barriers. Progestin-only injections and IUDs are generally better choices. It should be noted that neither valproic acid nor gabapentin affects serum levels of estrogen or progestin.

Anti-HIV protease inhibitors. Several of the anti-HIV protease inhibitors can change (either increase or decrease) serum levels of estrogen and progestins. Consult the labeling for specific anti-HIV protease inhibitors to see if OC use requires additional back-up methods or if different methods may need to be considered.

Broad-spectrum antibiotics. Broad-spectrum antibiotics such as amoxicillin and tetracycline, which alter the intestinal flora thought to be

instrumental in promoting absorption of the sex steroids, do *not* reduce the efficacy of OCs. Women using the antibiotics do have statistically significant but *not* clinically significant lower serum levels of estrogen and progestins. However, virtually every woman taking these antibiotics has remained well within the therapeutic range for the sex steroids.[168–170] As a result, back-up methods should not be necessary unless the patient has problems taking her pills, e.g., if her underlying medical condition interferes with pill taking or absorption. Long-term use of broad-spectrum antibiotics (such as erythromycin or tetracycline for acne) is compatible with OC use; back-up methods are not routinely needed for pregnancy prevention.[171]

Over-the-counter drugs. St. John's Wort is taken by many women to treat mild depression. Since this botanical agent does not require a prescription, women sometimes neglect to tell their health care providers that they are using it. St. John's Wort greatly increases hepatic metabolism of exogenous estrogen and progestin. Although little published data are available about the impact of this agent on pregnancy rates with OC use, some experts have recommended increasing the dose of emergency contraceptives by 50% in women using this over-the-counter antidepressant. The FDA has alerted providers that St. John's Wort may decrease the therapeutic effect of OCs.[172]

Another unanswered concern is that women who use Orlistat to block fat absorption may also reduce intestinal absorption of OC hormones. This concern is magnified if the woman experiences diarrhea from Orlistat use.

On a lighter note, the German National Chemists Association has advised women who use OCs to avoid eating too much licorice. Eating more than 10 to 50 gm a day of black licorice may trigger edema or elevate blood pressure, and OCs may do likewise.

OC effects on drug metabolism

The estrogen in combined hormonal contraceptives may alter hepatic clearance of other medications. Serum levels of fluoroquinolones, such as moxifloxacin and trovafloxacin, are significantly lower in OC users.[173] Similarly, estrogen promotes more marked metabolic clearance of some anticonvulsants, which would reduce circulating levels. Women starting these methods should have their anticonvulsant levels checked 1 month after OC initiation to insure that their medications are still in the therapeutic range. Conversely, estrogen-containing hormonal contraceptives may increase the effect of theophylline (used to treat asthma), the antipsychotic drugs diazepam (Valium) and chlordiazepoxide (Librium), and cyclic antidepressants. Doses of these drugs may need to be lowered with combined hormonal contraceptive use.

Drospirenone acts as an antimineralocorticoid and can interact with other potassium-sparing drugs to cause hyperkalemia. Women using ACE

inhibitors, angiotensin-II receptor antagonists, potassium-sparing diuretics, heparin, aldosterone antagonists, and NSAIDS on a daily basis to treat chronic conditions or diseases should have their serum potassium checked during the first cycle of drospirenone use.

INSTRUCTIONS FOR USING COMBINED PILLS

Pills work primarily by stopping ovulation (release of an egg), and they thicken a woman's mucus in her cervix to keep sperm out of the upper genital track. Pills have less than a 1% rate of failure if taken every day on schedule. In addition to preventing pregnancy, pills lower your risk of ovarian cancer, cancer of the lining of the uterus (endometrium), benign breast masses, and some kinds of ovarian cysts. Pills decrease menstrual blood loss, cramps, and pain. Pills tend to make acne and oily skin better. Pills also decrease your chance of having a dangerous ectopic pregnancy—a pregnancy outside of the uterus.

Remember: pills do not protect you from AIDS (acquired immunodeficiency syndrome) or other sexually transmitted infections. Use a latex or polyurethane male condom or a female condom every time you have sexual intercourse that could expose you or your partner to infection.

Be sure you know your clinician's telephone number in case of questions or problems.

Getting started

Your clinician will suggest one of three ways to begin taking pills:

- *Quick Start.* Take your first pill while you are in your clinician's office. This is the preferred method. Use a back-up contraceptive method for 7 days. You will not get your period until you finish taking the active pills.
- *First-day start.* Take your first pill on the first day of your next period.
- *Sunday start.* Take your first pill on the first Sunday, during your period. Use a backup method for 7 days.

Daily pill routine

1. Take 1 pill a day until you finish the pack. Then:
   - If you are using a 28-day pack, begin a new pack immediately. Skip no days between packages.
   - If you are using a 21-day pack, stop taking pills for 1 week and then start your new pack.
   - An alternative is to begin each new pack the day withdrawal bleeding begins.
2. Associate taking your pill with something else that you do at about the same time every day, like going to bed, eating a meal, or brushing your teeth.
3. Mark your calendar to remind yourself of the days you will begin a new pack of pills. Some women mark their calendar each day as they take their pills.
4. Check your pack of pills each morning to make sure you took your pill the day before.
5. Use a back-up contraceptive method if any of the following occur to make your pills less effective: you missed taking pills, were late starting your new pill pack, had severe vomiting or diarrhea, or are taking medications that lower the ability of the body to absorb contraceptive hormones (see the instructions on these specific problems). If you think you may have had sexual intercourse that was not adequately protected, consider emergency contraception. Call 1-888-NOT-2-LATE for more information.
6. Use condoms if you suspect, even a little, that you or your partner may be exposed to a sexually transmitted infection.
7. If you see a clinician for any reason or are hospitalized, be sure to mention that you are taking birth control pills.
8. You do *not* need to take a "rest" from taking pills. If you stop taking your pills, you risk becoming pregnant.

Missed pills

OC pills should be taken every day at about the same time. Missing a pill means taking it after an interval of more than 24 hours or not at all (completely missing a pill). The impact of a missed pill depends upon when in the pill packet you miss a pill (which week), how many pills you may have missed earlier in the pack, and whether you need to use emergency contraception. If you had only one episode of missed pills in packet, follow these directions:

# Pills Missed	Week Pills Missed	OC Recommendation	Finish this pack	Emergency contraception	7-day Back-up
1	1	Take 2 pills ASAP	Yes	Yes*	Yes
1	2-3	Take 2 pills ASAP	Yes	No	No
1	4	Skip placebo pills	Yes	No	No
2-4	1	Take 2 pills ASAP	Yes	Yes*	Yes
2-4	2	Take 2 pills ASAP	Yes	No	No
2-4	3	Start new pack	N/A	No	No
2-4	4	Skip placebo	Yes	No	No
5	Any	Take 2 pills – start new pack	N/A	Yes*	Yes

* Start emergency contraception as soon as possible. No need to double up on pills. Take the the next pill on the next day.

While these instructions are very complete, they are also very complicated. The odds are that if you miss a pill late in the pack, you probably missed a pill or took it late sometime earlier in the pill pack. For this reason, it has been suggested that if you miss active pills, think about whether you had intercourse in the last 120 hours:

- If you had no intercourse in the last 5 days, take 2 active OCs all at once, use a back-up method for 7 days, and finish the pill pack by taking 1 pill daily. You can skip the placebo pills in this pack and start a new pack immediately if you missed more than 4 pills.
- If you had intercourse in the last 5 days, use emergency contraception today (call your clinician to get some if you do not have any on hand). Restart daily OCs the next day to finish the pack. Use a back-up method for 7 days. You can skip the placebo pills of this pack and start a new pack immediately if you missed more than 4 pills.

Vomiting or diarrhea

Repeated vomiting or severe diarrhea can decrease the absorption of the hormones in pills. The longer you have vomiting or diarrhea, the greater the concern and the more important it would be to avoid intercourse, use condoms as a back-up contraceptive, and/or use emergency contraceptive pills.

Pills and your periods

1. *Short and scanty.* A drop of blood, or a brown stain on your panty liner, pad or on your underwear during the week you are taking no hormonal pills is counted as a period when you are on the pills.
2. *Spotting.* You may have very light bleeding between periods for the first few months you are on pills. If you have bleeding between periods, try to take your pills at the same time every day. Spotting is generally not a sign of any serious problem. If after the first few months you suddenly begin to have bleeding between periods (especially after intercourse) and have not missed pills or taken pills late, have your clinician check you for an infection or other problems. Spotting between periods may also signal decreased pill effectiveness. *Start each new package of pills on time.* Some clinicians recommend a back-up contraceptive when you have spotting, especially if you are taking a medication that may make the pill less effective.
3. *Missed period.* If you have not missed any pills and you miss one period without any other signs of pregnancy, pregnancy is very unlikely, but you may wish to get a pregnancy test if you are worried. Many women miss one period now and then. Call your clinician if you are worried. You are fairly safe and can start a new pack of pills on your regular day.

Here Is a Simple Way to Confirm That You Are Not Pregnant

If your period does not start during the last few days on 'reminder' pills or during the first 3 days of the pill-free interval, take your temperature with a special kind of thermometer. The basal body temperature (BBT) thermometer measures your lowest temperature, generally in the morning before you get out of bed. If your BBT is 98° F for 3 days in a row during the pill-free week, you are probably not pregnant.

Pills and pregnancy

1. If you decide you want to become pregnant, stop taking pills. Use prenatal vitamins for 1 to 3 months before you try to get pregnant. It is safe to become pregnant immediately after you stop the pill. The pill does not decrease your fertility; however, after you stop taking pills, you may have a 1- to 2-month delay before your periods become regular. You may wish to use another contraceptive method until you have at least 1 normal menstrual period off the pill. That way, when you become pregnant, your date of delivery can be calculated more easily.
2. If you become pregnant while taking pills, do not worry about the pills' impact on your pregnancy. It does not seem to increase the risk of having a baby with birth defects or of having a spontaneous abortion.

ACHES—PILL WARNING SIGNALS

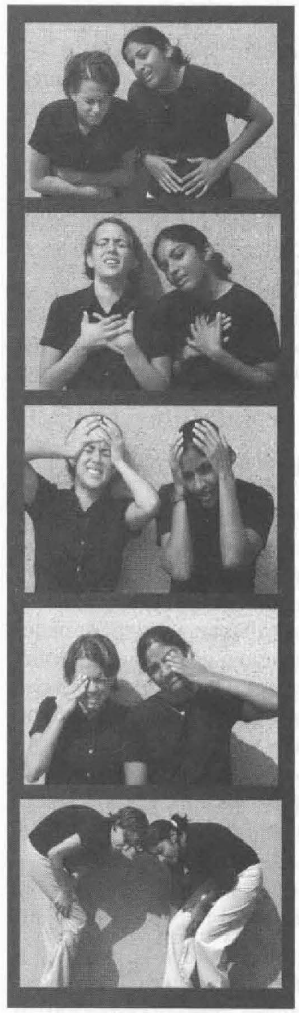
Call your clinician if you have any of the Pill Warning Signs (next page) or if you develop depression, yellow jaundice, a breast lump, a bad fainting attack or collapse, a seizure (epilepsy), difficulty speaking, a blood pressure above 160/95 mm Hg, a severe allergic skin rash, or if you are immobilized (in a wheelchair or bedridden) after an accident or major surgery. If major surgery is planned, switch from an estrogen containing contraceptive method 4 weeks before the operation. The risk of a blood clot in a vein is greatest if any of the following conditions are present: if you are overweight, immobile, have severe varicose veins, or if several members of your family have had a blood clot in a vein before age 45. Usually these warning signs have an explanation other than pills; get checked to be sure. *Do not ignore these problems or wait to see if they disappear.*

Pills and future fertility

1. Pills are a good option for women who want to become pregnant in the future.
2. By reducing the risk of causes of infertility such as pelvic infections, uterine fibroids, ectopic pregnancies, ovarian cysts, ovarian cancer, endometrial cancer, and endometriosis, OCs may improve your future ability to become pregnant.

PILL WARNING SIGNALS

Pills have been studied extensively and are very safe. However, very rarely pills lead to serious problems. Here are the warning signals to watch out for while using pills. These warning signals spell out the word **ACHES**. If you have one of these symptoms, it may or may not be related to pill use. You need to check with your clinician as soon as possible. The problems that could possibly be related to using pills are as follows:



ABDOMINAL PAIN

- Blood clot in the pelvis or liver
- Benign liver tumor or gall bladder disease

CHEST PAIN

- Blood clot in the lungs
- Heart attack
- Angina (heart pain)
- Breast lump

HEADACHES

- Stroke
- Migraine headache with neurological problems (blurred vision, spots, zigzag lines, weakness, difficulty speaking)
- Other headaches caused by pills
- High blood pressure

EYE PROBLEMS

- Stroke
- Blurred vision, double vision, or loss of vision
- Migraine headache with neurological problems (blurred vision, spots, zigzag lines)
- Blood clots in the eyes
- Change in shape of cornea (contacts don't fit)

SEVERE LEG PAIN

- Inflammation and blood clots of a vein in the leg

You should also return to the office if you develop severe mood swings or depression become jaundiced (yellow-color skin), miss 2 periods or have signs of pregnancy.

Source: Hatcher RA, et al. (2003),[149] with permission.

3. If your periods are irregular prior to taking pills, they may again become irregular after you stop taking pills.
4. Return of fertility is not improved by taking a break from pills.
5. You may experience some delay (an average of 2 to 3 months) in becoming pregnant compared with the amount of time it would have taken if you had not taken the pills. Do *not* count on this; if you do not want to become pregnant now, start using another contraceptive method right after you stop taking pills.
6. Between 1% and 2% of women will not menstruate for 6 months or more after stopping pills. However, it is not certain that OCs are responsible for this lack of periods.

Pills and smoking

If you smoke, stop. This is the single most important thing you can do for your health. If you cannot stop, try to cut back on the number of cigarettes you smoke. It is all the more important that you watch for the pill warning signals. If you smoke, you should probably *stop* taking pills at age 35, and definitely by age 40.

Pills and mood changes

If you notice mood changes—depression, irritability, or a change in sex drive—see your clinician. Switching pill brands may help if your mood changes are related to the pill. Depression, premenstrual symptoms (PMS), and sexual pleasure can improve on pills, but in some women they become worse.

Pills and Drug Interactions

A few drugs you may need to take for medical conditions may decrease the effectiveness of your pills. Be sure to tell all your clinicians that you are using OCs. If you are using drugs such as rifampin, griseofulvin, Dilantin (phenytoin), phenobarbital, topirimate, Tegretol (carbamazepine), or St. John's Wort, tell your clinician, because you may need to use stronger pills or a back-up method of contraception. Women using antiretroviral drugs may need lower or higher dose OCs.

DO BIRTH CONTROL PILLS CAUSE BREAST CANCER?

After more than 50 studies, most experts believe that *pills have little, if any, effect on the risk of developing breast cancer.* The Woman's Care Study found no increased risk for breast cancer among women currently using pills and a decreased risk of breast cancer for those women who had previously used pills. Use of pills by women with a family history of breast cancer was not associated with an increased risk for breast cancer, nor was the initiation of pill use at a young age.[174]

A recent summary of studies suggested that current users of pills are slightly more likely to be *diagnosed* with breast cancer.[175] Two factors may explain the increased risk of breast cancer being diagnosed in women currently taking pills: 1) a *detection bias*, meaning that pill users are simply more likely to have existing breast cancer identified because they have more breast exams or more mammography, or 2) *promotion* of an existing lesion that is nearly cancer into one that is cancer, usually an early cancer. Most authorities think the first explanation is most likely because the duration of pill use has no effect on risk and the excess risk seen in current users is restricted to breast cancers that are localized. Breast cancers diagnosed in women currently on pills or women who have taken pills in the past are more likely to be localized.[175] *By the age of 55*, the risk of having had breast cancer diagnosed is the *same* for women who have used pills and those who have not.

The conclusion of several studies of the risk for breast cancer in women on pills is that women with a strong family history of breast cancer do not further increase their risk for breast cancer risk by taking pills.[174–179]

While there are still unanswered questions about pills and breast cancer, today, four decades after their arrival on the contraceptive scene, the overall conclusion is that pills have little or no effect on breast cancer. *"Many years after stopping oral contraceptive use, the main effect may be protection against metastatic disease."* [175,180]

Transdermal Contraceptive Patch

The Ortho Evra transdermal contraceptive patch is a lightweight, wafer-thin, flexible, beige-colored, 20 cm^2 matrix patch. The patch consists of three layers: an outer protective layer of polyester; a medicated, adhesive layer; and a clear, polyester release liner, which protects the adhesive layer and is removed prior to application. Once the hormones are in circulation, they act the same way as orally administered hormones do to prevent pregnancy.

Each patch lasts 7 days. Women replace the patch each week for 3 weeks each cycle, then have a 7 day patch-free week, during which time they will start their withdrawal bleeding.

Advantages and Indications

The transdermal patch system is safe, effective, and rapidly reversible and can be used by healthy, nonsmoking women throughout the reproductive years. Because the hormonal mechanisms of action are similar, it is expected that the patch may provide many of the same advantages and non-contraceptive health benefits that OCs do, although data about long-term health benefits may not be documented for decades.

The patch offers the clear advantage of once-a-week dosing, which makes it easier to use successfully. In addition, the user can easily verify the presence of the patch, which can reassure her of continued protection. This reduces the anxiety many women report with OCs—questioning if they remembered to take today's pill and worrying that they might forget to take it. Given that by the third cycle of OCs, studies show that 54% of women missed more than 2 pills,[181] this concern seems justified. In a comparison of the clinical 3 trials, perfect use with the patch ranged from 92.9% to 93.6% whereas OCs were taken correctly by only 77.2% to 88.77% of women.

Disadvantages and Cautions

Although the patch avoids the challenges of daily administration, it still needs to be changed every week. It is difficult to conceal, so privacy is sub-optimal. Costs, storage and access issues are still present. The patch, as with all hormonal contraceptive methods, provides no protection against sexually transmitted infections. At-risk women should be counseled about safer sex practice and offered male condoms to reduce their vulnerability.

In addition to the health complications associated with combined hormonal contraceptives (myocardial infarction, stroke, VTE, hypertension, diabetes, gallbladder disease, cholestatic jaundice, hepatic neoplasms, etc.), the transdermal delivery system is associated with an increased risk of local skin irritation, redness or rash. The residual adhesive clinging to the skin after the patch is removed may need to be lifted off with baby oil.

Side effects

In the comparative clinical trials done in the United States, side effects reported by patch users were similar to those reported by pill users except that 20% of the patch users had unique complaints related to reactions at the application site. In addition, women using the patch were more likely than OC users to experience breast tenderness, vaginal spotting, and dysmenorrhea in the first 2 cycles. Within 3 months of use, the occurrence of these hormone-related side effects was similar between patch and pill users. The numbers of women who withdrew from the trial due to serious adverse effects were relatively small. However, overall more patch users than OC users withdrew from the study due to adverse effects (8.6% vs. 1.8%) or for specific complaints such as skin reactions (2.6% vs. 0%), nausea (1.5% vs. 0.3%), and dysmenorrhea (1.5% vs. 0.3%). Hyperpigmentation may develop under the patch application site. It is reversible but may take some time.

PRECAUTIONS

None of the women with medical contraindications to pill use is a candidate for the patch, unless the problem with pills relates to intestinal absorption of hormones. Additionally, women with conditions that affect the skin beneath the patch should not use the patch. The patch should not be placed over skin that is red, irritated, or cut. Women with psoriasis, eczema or sunburn may not be able to use the patch. Women should periodically confirm that the patch is firmly adherent and avoid using any creams, lotion, or oils near the patch since those agents may cause the patch to detach. The effectiveness of the patch is reduced in women who weigh more than 198 pounds.

PROVIDING THE TRANSDERMAL PATCH

Talk to the patient about how and where to store her patches. Remind her that when she removes a patch, she should fold it closed to reduce release of the hormones. She should not flush the used patch into the water system, but should dispose of it in the garbage as solid waste.

The patient can start her patch on the Sunday following the first day of her menses or on the first day of her flow. If she starts on Sunday, she should use a back-up method for 7 days; if she starts on the first day of her flow, she needs no back-up method. The calendar reminders that accompany the patches can accommodate either approach. The Quick Start for the patch may be reported soon.

Switching from other methods. Contraceptive sex hormone levels reach reliably therapeutic levels about 48 hours after patch placement; therefore, women switching from OCs should apply their first patch as soon as their pill withdrawal period starts, but no later than 4 to 5 days after their last active pill. If they use the Sunday start method, they will need 7 days of back-up contraception. They should *not* wait until they complete their last pack of pills to start the patch. Women switching from injectable contraceptives (DMPA) should apply their patches when they are due for their next injection.

MANAGING PROBLEMS AND FOLLOW UP

Dislodged or detached patches. During clinical trials involving over 70,000 patches, fewer than 3% required replacement for partial detachment and fewer than 2% were replaced because they became fully detached. Patches adhered well in humid conditions (saunas), in exercise conditions, and during swimming. In freezing weather, the patch should be worn beneath clothing.

- If the patch is partially detached, it should be firmly pressed in place for 10 seconds. Reconfirm that the edges are sticking well. If it sticks well, the woman can continue to use it for the full 7 days. If it does not stick well, tell her to remove it and apply a replacement patch.
- If the patch is completely detached, she should try to reapply the same patch if it is clean and usable. If it cannot be used, tell her to apply a new patch immediately.

If the patch has been partially or completely detached for more than 24 hours or if the woman does not know how long it has been loose, instruct her to use a back-up method for 7 days. Consider the need for emergency contraception.

Missed patches and late patches. Management of missed patches depends upon which patch is forgotten and how long it is missed:

When patched missed	Management
1st week patch.	• If a patch is forgotten or late the first week, give emergency contraception if the woman has had unprotected intercourse. • Tell her to place the patch immediately. • She should use a back-up method for 7 days. • The woman will change her patch each week on the day of the week she started this new patch from now on.
2nd—3rd week patch	• *1-2 days late*: the woman must remove the old patch and place a new one immediately. No back-up method or emergency contraception is needed. • *More than 2 days late*: Have her remove the old patch and place a new one on immediately. Provide emergency contraception if she has had unprotected intercourse (especially if she is 4 days or more late applying her patch). She should use back-up method for 7 days. Tell her to change the patch each week on the day of the week that she placed this new patch.
4th week patch	• Tell her to remove the patch. • She should place a new one on the usual day. • No back-up method or emergency contraception is needed.

USING THE TRANSDERMAL SYSTEM

One patch is used for 7 days. Apply a new patch once a week on the same day for 3 weeks in a row. During the 4th week, do not wear a patch. At the end of the week, start another cycle of patches.

Applying the patch

1. Each patch is packaged in an individual foil packet. To place the patch, open the pouch by tearing along the top edge and one side edge. Peel the foil pouch apart and open it. Lift the patch and its clear plastic cover out of the foil pouch together by using a fingernail to peel the unit off the foil pouch.
2. Fold the patch open. Hold onto one half and peel the plastic off the other half. Apply the sticky side of the opened patch to the skin. Press it in place. The patch can be placed on the buttock, abdomen, upper torso (excluding the breasts), or on the outside

of the upper arm. Avoid placing patches in areas of friction such as under bra straps or thongs. The patch should be applied only to clean, dry skin. Do not put it over skin that is irritated, sunburned, red or infected. Make sure there are no creams, oils, sunscreen, or sweat on the skin or the patch will not adhere.

3. Fold the patch in half, remove the clear plastic cover, open it and apply the rest of the sticky side of the patch to the skin. Press firmly on the patch for 10 seconds. Run your finger around the edges of the patch to make sure that all parts of the patch are sticking properly.

Wearing the patch

1. Keep the patch in the same place for 7 days; then remove it. Check the patch every day to make sure it is fully adherent.
2. Apply a new patch in a different spot on your body. Wear it for 7 days. Repeat the procedure for a third week.
3. During the fourth week, do not wear a patch. You will begin your menstrual period.
4. After a week without wearing a patch, apply a new "first-week" patch on the same day of the week you applied your other patches.
5. Store the patches in their protective pouches at room temperature.

Removing the patch

1. To remove the patch, grasp it by an edge and pull it off. Fold it closed on itself on the adhesive side to seal in the medication.
2. Discard the patch in the solid waste garbage; do not flush it into the waste water system.
3. If any stickiness or adhesive remains on your skin, remove it by using baby oil; do not use harsh chemicals such as nail polish remover, alcohol, etc.

Vaginal Contraceptive Ring

The vaginal contraceptive ring (NuvaRing) is a flexible, soft, transparent ring made of the plastic ethylene vinyl acetate. The ring has an outer diameter (side to side) of 54 mm and a cross-sectional diameter of 4 mm. The ring releases ethinyl estradiol and etonorgestrel in steady, low doses so that serum levels are lower than the patch or pills.

The woman places one ring high in the vaginal once every 28 days. The ring is kept in place for 21 days and removed for a 7-day ring-free period to permit withdrawal bleeding. Hormonal levels needed to suppress ovulation are achieved within the first day of vaginal ring use, so there is no delay in onset of contraceptive protection, as seen with the transdermal patch. The ring has a steady release rate, so serum hormone levels do not fluctuate during the day the way they do with OCs.

Advantages

The once-a-month self-administered use permits convenience, privacy, and ease of use. It is relatively easy for a woman to confirm that the device is in place. The NuvaRing releases low, steady amounts of ethinyl estradiol and etonorgestrel. Cycle control is another advantage; in every cycle, fewer than 10% of women experienced any untimely spotting or bleeding. In a comparative trial of vaginal ring versus a 30 mcgEE/0.15 levonorgestrel OC, the NuvaRing provided significantly better cycle control.[182] Overall satisfaction with the method was relatively high (85%); 96% to 98% of users reported that the ring was easy to insert and remove; and 83% said they rarely or never felt the ring during intercourse. Nine out of 10 study participants said they would recommend the vaginal ring to a friend.[183]

Disadvantages and Cautions

Some women may be hesitant to touch their genitalia to place and remove the rings. Although the rings may be stored at room temperature for up to 4 months, it is generally preferred that rings be kept refrigerated to prolong their active life. This may pose challenges for women who need private methods.

Health complications. In addition to the health complications associated with combined hormonal contraceptives (myocardial infarction, stroke, VTE, hypertension, diabetes, cholestatic jaundice, hepatic neoplasms, etc.), the vaginal delivery system may be associated with localized conditions such as vaginal discomfort and vaginal discharge.

Side effects. Overall, relatively few users reported hormone-related side effects: headaches (5.8%), nausea (3.2%), and breast tenderness (2.0%). Local side effects specific to the ring were also reported at the following rates: vaginitis (5.6%), leukorrhea (4.6%), other device-related problems (4.4%), and vaginal discomfort (2.4%).

In the combined (North American and European) clinical trial, 15.1% of women withdrew because of adverse events such as the sensation of a foreign body, coital problems and expulsion; headaches (1.3%); emotional lability (1.2%); and weight increase (1%). Fewer than 1% of women stopped because of bleeding irregularity, vaginitis, or leukorrhea.

Precautions

Women who have medical contraindications to OC use (except for those contraindications related to intestinal absorption problems) are not candidates for the vaginal ring, nor are women who have significant pelvic relaxation, are unable to touch their genitalia, or who have vaginal obstruction. The NuvaRing may not be suitable for women with conditions that make the vagina more susceptible to infection or ulceration. The NuvaRing should not be used in conjunction with a diaphragm, since it may prevent correct placement of that barrier.